ABSTRACT OF THE DISCLOSURE

Electrochemical test strips and methods for their use in the detection of an analyte in a physiological sample are provided. The subject test strips have a reaction zone defined by opposing metal electrodes separated by a thin spacer layer. The metal surface of at least one of the electrodes is modified by a homogenous surface modification layer made up of linear self-assembling molecules having a first sulfhydryl end group and a second sulfonate end group separated by a short chain alkyl linking group, where 2-mercaptoethane sulfonic acid or a salt thereof is preferred in certain embodiments. The subject electrochemical test strips find application in the detection of a wide variety of analytes, and are particularly suited for use the detection of glucose.